Notes on Australian Lepidoptera.

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[Read September 6, 1898.]

Plate V.

SYNTOMIDIDÆ.

The great majority of the Australian species of this family are referable to the genus *Hydrusa*. My attention was first called to this group by the difficulty experienced in identifying one of our commonest Brisbane insects, described below under the heading of *Hydrusa aperta*, Walk. Fortunately, nearly all the types of the species described by Mr. Meyrick (Proc. Linn. Soc., N.S.W., 1886, p. 773) are contained in local collections. During a recent short stay in Sydney, I took the opportunity of carefully examining those in the Macleay and Australian Museums, and comparing them with my own examples; and I must express my gratitude to the Curators of these museums for their kind assistance. I am also much indebted to Dr. T. P. Lucas for an opportunity of examining types in his valuable collection, and to the Queensland Museum for the loan of specimens.

The difficulty of determining the species of this genus lies in the great uniformity of marking, combined with the considerable range of variability in certain species. For this reason they cannot be satisfactorily studied from isolated museum specimens, but need large series of specimens from various localities for comparison. Series bred from the larvæ would be specially valuable. Mr. Meyrick has, I believe, in spite of the thoroughness and accuracy of his work, been misled in at least one instance into making several species out of one by the paucity of his material.

I do not regard the present contribution as in any way final, for much remains to be learnt of the species inhabiting Northern Queensland, where the genus is most abundantly represented. Of many species, I have seen only a few isolated types; and of those enumerated below, some may, I think, be regarded as perfectly well-established and distinct species:—*Hydrusa humeralis*, Butl.; *H. xanthosoma*, Turn.; *H. ecliptis*, Meyr.; *H. stelotis*, Meyr.; *H. pyrrhodera*, Meyr.; *H. leucacma*, Meyr.; *H. aperta*, Walk.; *H. orphnæa*, Turn.; *H. recedens*, Luc.; *H. annulata*, F.; *H. phepsalotis*, Meyr.; *H. bicolor*, Walk.

The following I regard as species concerning which further information is required, although the majority at least are likely

to stand :—*H. sphenophora*, Turn. ; *H. chlorometis*, Meyr. ; *H. hyalota*, Meyr. ; *H. cyanura*, Meyr. ; *H. antitheta*, Meyr. ; *H. humeralis*, Butl. ; *H. eschatias*, Meyr. ; *H. trigonophora*, Turn.

There are three of Meyrick's species, concerning which, from lack of material, I am unable to form an opinion :—*Hydrusa paraula*, Meyr. ; *H. anepsia*, Meyr. ; *H. macroplaca*, Meyr.

In determining the species, the wing markings are of little value in most instances, as they are both very similar in different species, and variable in the same species. I have followed Meyrick in assuming a normal five spots on the forewings in each instance. A connecting spot between the fourth and fifth is sometimes present. Its full development, so as to unite these two into one large spot, is an important character, but its partial development is valueless, as a small spot in this region is frequently present, or completely absent, in one and the same species. Occasionally the first and third spots are partially confluent as an abnormal variety, but I have never seen them completely merged except in *H. ecliptis* and *H. lampetis*, where they are combined. The white apices to the antennæ of some species is a valuable character, also the presence or absence of yellow or orange spots on the thorax. The thorax is, however, frequently rubbed in imperfect or badly-pinned specimens. The presence or absence of orange on the posterior abdominal segments also furnishes good characters, though a slight extent of variation must here be allowed for.

I have given a complete list of the known Australian species of this family, and have incorporated the localities given in Meyrick's paper. But the section of the *Hydrusa* with black anal segments still remains in an unsatisfactory condition ; *H. leucacma*, Meyr., is a well-defined species ; for the discrimination of the other forms new series of specimens are required.

In Plate V., which is reproduced from a photograph, figures 1 to 6 inclusive and 8 are varieties of *H. aperta*, Walk. ; 7. *H trigonophora*, n. sp.; 9. *H. leucacma*, Meyr. ; 10. *H. orphnœa*, n. sp. ; 11. *H. ecliptis*, Meyr. ; 12. *H. lampetis*, n. sp. ; 13. *H. phepsalotis*, Meyr.; 14. *H. pyrrhodera*, Meyr.

AGAPHTHORA, *Meyrick.*

AGAPHTHORA MELANORA, *Meyr.*

I know of only the type specimens in the Macleay Museum, which are from Cape York, Queensland.

AGAPHTHORA SPHENODES, *Meyr.*

Cairns, Queensland ; Macleay and Queensland Museums.

SYNTOMIS, *Ochsenheimer.*

Tongue well developed. Antennæ in male simple, without serrations, with very short even ciliations ($\frac{1}{5}$). Palpi short,

porrected, loosely scaled. Spurs very short. Forewings with 2 from about $\frac{2}{3}$, 4 and 5 approximated at base, 7 out of 8 below 10; 9, 10, and 11 out of 8. Hindwings with vein 4 absent, 3 and 5 separate at base, 6 absent.

The neuration resembles *Choromeles*, Meyr., but the antennæ are non-pectinated.

Syntomis angustipenna, *Lucas.*

Hydrusa angustipenna, Lucas, Proc. Linn. Soc., N.S.W., 1889.

Male and female, 23-27 mm. Head and face black, collar orange. Antennæ wholly black. Thorax black. Abdomen orange, bases of segments broadly black, two apical segments and anal tuft wholly black. Forewings blackish, spots rather small, semi-transparent, dull orange; basal spot absent; second wedge-shaped, with apex obtuse, anterior; third trapezoidal or triangular; fourth elongate, sometimes surmounted by a small dot; connecting spot absent; fifth roundish, fairly evenly bisected. Hindwings black with a roundish basal orange spot.

In the females the spots are rather larger than in the males. Brisbane.

HYDRUSA, *Walker.*

Tabulation of Species.

1.	Abdomen wholly orange	*xanthosoma*
	Abdomen not wholly orange	2
2.	Forewings wholly black without spots	3
	Forewings with spots present	4
3.	Anal tuft black	*bicolor*
	Anal tuft orange	*eschatias*
4.	Forewings with spots colourless	5
	Forewings with spots more or less orange	6
5.	Thorax with orange spots	*pyrrhodera*
	Thorax wholly black	*hyalota*
6.	Connecting spot between fourth and fifth completely developed (as long as fifth)	7
	Connecting spot absent or only partially developed (less than half fifth)	11
7.	First and third spots wholly confluent	8
	First and third spots separate	9
8.	Spots large, those of hindwings wholly confluent ...	*ecliptis*
	Spots small, those of hindwings touching only	*lampetis*
9.	Patagia partly yellowish	*chlorometis*
	Patagia wholly black	10
10.	Antennæ with apex white	*stelotis*
	Antennæ wholly black	*sphenophora*
11.	Abdomen with last two or three segments wholly black	12
	Abdomen with last two or three segments not wholly black	14
12.	Abdomen wholly black beneath, or with only a few orange scales	*cyanura*
	Abdomen with orange markings beneath	13

13.	Hindwings with basal spot obsolete	*leucacma*
	Hindwings with basal spot well developed	*antitheta*
		paraula
		anepsia
		macroplaca
14.	Antennæ with apex white	15
	Antennæ wholly black	16
15.	Spots small, opaque, deep orange	*phepsalotis*
	Spots moderate, semitransparent	*annulata*
16.	Abdomen hairy	17
	Abdomen smooth-scaled	18
17.	Thorax with yellowish markings	*recedens*
	Thorax wholly black	*orphnæa*
18.	Patagia orange	*humeralis*
	Patagia black	19
19.	Distal spot of hindwings triangular, touching basal spot on median vein	*trigonophora*
	Distal spot of hindwings roundish	*aperta*

HYDRUSA XANTHOSOMA, *n. sp.*

Male, 25-28 mm. Antennal pectinations well marked, $1\frac{1}{2}$. Veins 3 and 5 of hindwings closely approximated at base.

Head and face orange. Antennæ fuscous, irrorated dorsally with orange scales. Thorax orange. Abdomen orange without black markings, tuft orange with a few lateral fuscous hairs. Legs orange, anterior and middle tarsi fuscous. Forewings blackish, with confluent orange spots; first spot, small, roundish; second, wedge-shaped; an additional orange streak separated by blackish vein from second spot, and by a narrow black line from costa; third, elongate prolonged upwards and inwards, separated from second only by median vein; fourth, elongate, surmounted by an additional spot; fifth, bisected by a black vein into two equal elongate segments; an elongate connecting spot developed between fourth and fifth; and another between fifth and third; these confluent spots leave two small black areas, first beyond second spot, sometimes confluent with costal and anal black areas; second separating first and third spots. Hindwings orange, hindmargin broadly but irregularly blackish, a small black dot below middle of costa.

Varieties.—The extent of orange suffusion relatively to black ground color varies. The connecting spot between fourth and fifth, usually well developed, may be completely absent.

A very distinct species, remarkable for the absence of black rings on abdomen, and the unusually developed confluent orange markings on wings.

Barrier Range, North-West Australia; some half-dozen specimens, all males (Coll. Macleay), one of which is now in my collection.

Hydrusa ecliptis, *Meyr.* Pl. v., fig. 11.

Brisbane. One specimen taken by Mr. Illidge. This exactly corresponds with the types in the Macleay collection, which are from Cooktown.

Hydrusa lampetis, *n. sp.* Pl. v., fig. 12.

Female, 35 mm. Head and face reddish-orange, with a broad black line between antennæ. Antennæ black to apex. Thorax wholly black. Abdomen orange, bases of segments black; two terminal segments wholly black, except anal hairs; beneath wholly black. Forewings dull-blackish fuscous, with a brilliant purple lustre in oblique light; spots small, pale-dull-orange, reddish-tinged, semi-transparent; first coalescing with third to form an elongated oblong spot of moderate size; second small, wedge-shaped; fourth elongate, connected with fifth by an equally large additional spot; fifth bisected unequally, upper segment elongated, lower sub-triangular. Hindwings dull-blackish-fuscous with purple lustre; spots pale-orange, semi-transparent; basal spot small, bisecting vein not black; second very small, triangular, touching first.

It is possible that this may be an extreme variety of *H. ecliptis.* The present species is distinguished by the much smaller spots and by the distal spot of hindwing not being completely merged with basal spot.

Bowen, Queensland; one specimen (Coll. Queensland Museum).

Hydrusa sphenophora, *n. sp.*

Male and female, 31-36 mm. Head and face orange, with a narrow black line between antennæ. Antennæ black to apex. Thorax black, with a conspicuous posterior orange spot. Abdomen orange, base of segments narrowly fuscous above, more markedly so beneath, apical segment blackish-fuscous, tuft orange. Forewings black with greenish-iridescence, spots moderate or rather large, pale-dull-orange, opaque; first subquadrate, broadly separate from third; second wedge-shaped, apex anterior, obtuse; third irregular oblong, prolonged upwards anteriorly, where it is separated from second only by vein; fourth connected by an additional spot with fifth, the whole forming a broad wedge with apex downwards, separated by veins into four segments, decreasing in size from above downwards, upper three elongate, lowest triangular. Hindwings with spots same colour as forewings, large and confluent; leaving an irregular black line along hind-margin, thickest at apex, toothed below middle; and a black spot below middle of costa.

Allied to *H. ecliptis* and *H. stelotis.* From the former distinguished by separation of first and third spots, from the latter by

black-tipped antennæ, large and confluent spots of hindwings, &c., but more material is necessary to satisfactorily determine the limits of variation of these species. Barrier Range, North-West Australia; two specimens (Coll. Macleay).

HYDRUSA CHLOROMETIS, *Meyr.*

I have not seen a type of this species, but from the description it appears to be very distinct, belonging to the group in which connecting spot between fourth and fifth is fully developed, and characterised by the ochreous-yellow spots on patagia and thorax.

The type specimen was taken by Mr. Meyrick at Glen Innes, New South Wales, in December.

HYDRUSA STELOTIS, *Meyr.*

I have only seen the types, which appear very distinct.

Cooktown (Macleay Museum).

HYDRUSA PYRRHODERA *Meyr.* Pl. v., fig. 14.

Thursday Island, Cape York, Cooktown, and Cairns, Queensland. The Queensland Museum contains a large series from the last-named locality.

HYDRUSA HYALOTA, *Meyr.*

Cape York, Queensland; one specimen each in the Macleay collection and that of the Queensland Museum. Fresh specimens are required to establish with certainty its distinctness from the preceding.

HYDRUSA LEUCACMA, *Meyr.* Pl. v., fig. 9.

There are five male specimens of this species in Coll. Lucas. It closely resembles some forms of the following species in the forewings and thorax; but may be readily distinguished by the obsolescence of basal spot of hindwings, and complete blackness of three apical abdominal segments including anal tuft. There are five orange markings on dorsal surface of abdomen of male.

Cairns, Queensland.

HYDRUSA APERTA, *Walk.* Pl. v., figs. 1-6 and 8.

Syntomis aperta, Walk., Suppl. 72, Meyr., l.c., 134.; *Hydrusa pyrocoma*, Meyr., 127; *H. synedra*, Meyr., 128; *H. hesperitis*, Meyr., 129; *H. mochlotis*, Meyr., 132; *H. nesothetis*, Meyr., 133.

The distinguishing features of this species are the large size, 33-48 mm. (but dwarfed specimens also occur), the black antennæ, the broadly orange head, the conspicuous yellow posterior thoracic spot, the seven orange bars on the abdomen of male, six in female (the last two of these may be reduced in size, or nearly obsolete), the very elongate fourth spot of forewings, and the well-developed basal spot of hindwings.

Varieties.—The wing-markings are extremely variable. The sexes are usually easily distinguishable, the males being broader-winged, with smaller and more widely separate spots; in the females the spots are usually larger, more closely approximated (rarely tending to coalesce), and supernumerary spots are often present.

To enter into details — The fourth spot is sometimes surmounted by a small extra spot. The connecting spot between fourth and fifth may be entirely absent, or rudimentary, or well-developed, about half-length or less of upper segment of fifth spot. A small spot resting on second spot is rarely present in the male, frequently in the female. Very rarely first and third spots are partially confluent (one specimen). In hindwings distal spot may be small (especially in males), with upper segment small or absent, or large (especially in females), with upper segment well developed. In the abdomen the orange on the dorsal surface of penultimate and ante-penultimate segments may be reduced to small central dots. Beneath the two ante-apical segments may have the orange fairly well-marked, reduced to a few scattered scales or absent. The anal tuft is always orange.

After careful comparison with the types in the Macleay and Australian Museums, I believe that all Meyrick's names given above are synomyms for one variable species. All the forms occur commonly about Brisbane. At the same time I would freely acknowledge, that if my material had been restricted to Mr. Meyrick's types, I should have regarded them as separate species as he has done.

With regard to *Syntomis aperta*, Walk., I have felt considerable difficulty. Walker's description of the wings I cannot understand, but he says "scutellum" is yellow, which is suggestive of this species. Meyrick describes the thorax as black, but this, I believe, after examining them, to have been due to his types being rubbed. That in Dr. Lucas' collection has a conspicuous posterior yellow spot. Mr. Meyrick describes the antennæ as white at apex, but I cannot help regarding this as an error. Careful inspection of the types named by him *aperta* in the Macleay, Australian Museum, and Lucas' collections shows no more than a doubtful paleness of the terminal joint in one instance, due to loss of scales. These types appear to me to be certainly referable to the common Brisbane species.

If my conclusions be correct, the species has a wide range from the extreme north of Queensland to South Australia. It is very common in the neighbourhood of Brisbane. Mr. R. Illidge finds the larvæ in his garden feeding on various weeds and decaying leaves and fruit they are densely clothed with brown hairs.

HYDRUSA TRIGONOPHORA, *n. sp.* Pl. v., fig. 7.

Male and female, 25-35 mm. It differs from *H. aperta*, Walk., in the smaller size, in the distal spot of hindwings triangular, instead of roundish, the apex of triangle touching basal spot on median vein, and in tuft of male being black laterally. At first, I regarded it as a variety of the preceding; but have now five specimens taken at Brisbane and Stradbrooke Island, and have seen many others, all of which show the differences to be constant.

HYDRUSA CYANURA, *Meyr.*

One specimen (Coll. Lucas); said to be from Thursday Island, Queensland. There is a second specimen in this collection.

HYDRUSA ANTITHETA, *Meyr.*

I saw a type of this species in the Australian Museum, and it seemed to me distinct; distinguished from *H. aperta* by the two apical segments being wholly black. Whether a posterior thoracic spot was present I could not decide. No trace of it is discernible, but the pin goes through where it might have been.

I have received a specimen from Bundaberg, which resembles the type of *H. paraula*, Meyr., in the Macleay Museum. This may or may not be distinct from the foregoing. The posterior spot is very distinct.

I have not seen the types of *H. anepsia*, Meyr., and *H. macroplaca*, Meyr., and can therefore express no opinion on these species.

HYDRUSA HUMERALIS, *Butl.*

(Journ. Linn. Soc., 1876, 352).

Male and female 24-30 mm. Antennal pectination in male rather long (2). Head orange, obscurely fuscous between antennæ. Antennæ black to apex. Thorax black with orange patagia, and a conspicuous posterior orange spot. Abdomen orange, bases of segments broadly blackish; apical segment in male blackish, with a small dorsal orange spot, in female pale orange. Forewings blackish, spots pale orange, opaque, rather small; first, roundish or oval; second, wedge-shaped, apex anterior, obtuse; third, irregular-oblong or sub-triangular; fourth, elongate, sometimes surmounted by an additional dot; connecting spot absent; fifth, roundish or oval, evenly bisected by a black vein. Hindwings black, with spots large and confluent, somewhat constricted at point of union.

Distinguished by long antennal pectinations of male, confluence of spots of hindwings, and especially by the orange patagia.

Barrier Range, North-West Australia; two specimens (Coll. Macleay). The British Museum type is stated to be from North Australia. I have two specimens from Brisbane and Stradbrooke Island, and have seen others, which differ from the types in spots of hindwings being separate; for the present I include them in the present species.

Hydrusa orphnæa, *n. sp.*

Male and female 24-27 mm. Head broadly black on crown, collar yellow. Face black in male, in female mixed with ochreous. Antennæ black to apex. Thorax black. Abdomen with hairy yellow scales, bases of segments black. Forewings black without iridescence, thinly scaled; spots moderate, pale orange, semitransparent; first, small, subquadrate; second, larger, bluntly wedge-shaped; third, nearly triangular, anterior angle produced towards second, and truncate; fourth, elongate, surmounted by a small dot, connecting spot absent; fifth, roundish, bisected by a black vein. Hindwings, basal spot rather larger, irregularly outlined, unequally divided by a fine black vein; distal spot well developed, upper segment nearly as large as lower.

Readily distinguished by the hairy abdomen and the scantily-clothed forewings, which give the species a very distinct appearance. The black face of the male is a very marked character, but may not be constant. The male is broader winged.

Ballandean, Queensland, and Tenterfield, New South Wales, three specimens in February.

Hydrusa annulata, *Fab.*

Zygaena annulata, F.E.S., 389; *Syntomis annulata*, Boisd. Zyg. 122, pl. vii., 8, pl. viii., 2; *Hydrusa cingulata*, Butl., Journ. Linn. Soc. 1876, 352; *H. nigriceps*, ib. 352; *H. intensa*, ib. 353, Meyr. l.c. 136.

The earlier synomymy is taken from Meyrick's paper. I have read Butler's descriptions and do not find in them any tangible points of distinction. His *Hydrusa intensa* is recognised by Meyrick, but the point of distinction given by the latter is untenable. I have taken every gradation from nearly complete absence to considerable development of upper section of distal spot of hindwings on the same day under circumstances which left no doubt as to specific identity.

Varieties.—A very constant form in its markings. In Brisbane the males are slightly larger and broader-winged than the females, in specimens from Ballandean and Tenterfield the disparity is much more marked. The anal tuft of the male, normally wholly orange, is sometimes black at the sides, as in *H. phepsalotis*. In forewings the fourth spot is rarely surmounted

by a small extra spot. I have one female specimen in which the first and third spots, normally widely separate, are confluent.

Brisbane, Stradbrooke Island, and Moreton Bay District generally; Ballandean, Maryborough, Rockhampton, and Cooktown, Queensland; Tenterfield, Grafton, Sydney, and Wollongong, New South Wales; also from Tasmania. Common and generally distributed.

HYDRUSA PHEPSALOTIS, *Meyr.* Pl. v., fig. 13.

This may be distinguished best from *H. annulata* by the small, intensely orange spots on the wings. The anal tuft, orange, with black sides, is characteristic, but is occasionally found as a variety in the latter species, as is the obsolescence of upper part of basal spot of hindwings.

Var. æthiops. In the Macleay Museum are two specimens from Sydney and Illawarra, in which the spots on the wings are extremely small. In both the distal spots of the hindwings are absent. In one the posterior spots of the forewings are absent, only three minute basal spots being present.

Maryborough and Mount Tambourine, Queensland; Sydney and Illawarra, New South Wales.

HYDRUSA RECEDENS, *Luc.*

(Proc. Linn. Soc., N.S.W., 1891.)

Male, 17 mm. Head and face ochreous-yellow; a few fuscous scales between antennæ. Antennæ black to apex. Thorax black, with some ochreous-yellow scales posteriorly, patagia fuscous or light-ochreous-yellow. Abdomen with hairy yellow scales, bases of segments black; seven yellow markings on dorsal surface; tuft pale-ochreous, at sides fuscous. Forewings black, rather thinly scaled, without iridescence; spots pale-ochreous, semitransparent; first and second spots quadrangular; third triangular; a well-developed lenticular spot between second and third; fourth narrow-elongate, surmounted by a faint ochreous line; connecting spot indicated by a small dot; fifth spot roundish, evenly bisected. Hindwings with basal spot well developed; distal moderate, remote, upper segment small.

Immediately distinguished by its small size from all other species. It appears to be variable; the colour of the patagia differs in the two specimens. The lenticular spot between second and third spots would be a good character if constant. In the hairy abdomen it differs from all except *H. orphnæa.*

Duaringa, Queensland.

HYDRUSA ESCHATIAS, *Meyr.*

I have only seen the type in the Macleay Museum. The locality is unknown.

HYDRUSA BICOLOR, *Walk.*

Euchromia (Hydrusa) bicolor, Walk., Bomb. 255, Butl. Ill. Het. I. 19, pl. ix. *Hydrusa bicolor*, Meyr., l.c., 139.

Cairns, Queensland, apparently common (Macleay and Queensland Museums). Mr. R. Illidge has taken one specimen at Brisbane.

CHOROMELES, *Meyrick.*

CHOROMELES GEOGRAPHICA, *Meyr.*

Taken commonly about Brisbane in October and again in March.

CHOROMELES STREPSIMERIS, *Meyr.*

I have seen only the type in the Macleay Museum ; it is from Bowen, Queensland.

EUCHROMIA, *Hb.*

EUCHROMIA POLYMENA, *Lin.*

Sphinx polymena, Lin., Syst. Nat. II., 106 ; Cr. 13, D.; Meyr., l.c., 142. North Australia; one specimen in the Macleay Museum.

EUCHROMIA IRUS, *Cr.*

Sphinx irus, Cr., 368A; *Slaucopis irius*, Boisd., Voy. Astr., V., 192 ; *S. ganymede*, Dbld. Soct. Disc., 519, Pl. III., 3; *Euchromia irus*, Meyr., l.c., 143. Cape York and Cookstown, Queensland.